

This is a  
**CONTROLLED DOCUMENT**

EG&G - ROCKY FLATS PLANT  
ENVIRONMENTAL MANAGEMENT

This is a RED Stamp

**ROCKY FLATS PLANT  
EMD OPERATING  
PROCEDURES MANUAL**

Manual No.: 5-21000-OPS-FO  
Procedure No.: Table of Contents, Rev 13  
Page: 1 of 2  
Effective Date: 05/12/92  
Organization: Environmental Management

**THIS IS ONE VOLUME OF A SIX VOLUME SET WHICH INCLUDES:**

**VOLUME I: FIELD OPERATIONS (FO)  
VOLUME II: GROUNDWATER (GW)  
VOLUME III: GEOTECHNICAL (GT)  
VOLUME IV: SURFACE WATER (SW)  
VOLUME V: ECOLOGY (EE)  
VOLUME VI: AIR (AP)**

**TABLE OF CONTENTS  
FOR VOLUME I: FIELD OPERATIONS**

<b>Procedure No.</b>	<b>Title</b>	<b>Rev. No.</b>	<b>Effective Date</b>
FO.01	Air Monitoring and Dust Control	1	08/30/91
FO.02	Transmittal of Field QA Records	2	09/23/91
FO.03	General Equipment Decontamination	2	05/12/92
FO.04	Heavy Equipment Decontamination	2	05/12/92
DCN 92.01	Clarification of Work Area	1	01/31/92
DCN 92.02	Clarification of Center Bit Decontamination	1	03/12/92
FO.05	Handling of Purge and Development Water	2	05/12/92
FO.06	Handling of Personal Protective Equipment	2	05/12/92
FO.07	Handling of Decontamination Water and Wash Water	2	05/12/92
FO.08	Handling of Drilling Fluids and Cuttings	2	05/12/92
FO.09	Handling of Residual Samples	1	08/30/91
FO.10	Receiving, Labeling, and Handling Environmental Materials Containers	2	05/12/92

**ADMIN RECORD**

A-SW-001027

REVIEWED FOR CLASSIFICATION/UCI

By

Date

*[Signature]*  
12/18/92  
*[Signature]* 4/2/92 *[Signature]*

**ROCKY FLATS PLANT  
EMD OPERATING  
PROCEDURES MANUAL**

**Manual No.: 5-21000-OPS-FO  
Procedure No.: Table of Contents, Rev 13  
Page: 2 of 2  
Effective Date: 05/12/92  
Organization: Environmental Management**

<b><u>Procedure No.</u></b>	<b><u>Title</u></b>	<b><u>Rev. No.</u></b>	<b><u>Effective Date</u></b>
FO.11	Field Communications	2	05/12/92
FO.12	Decontamination Facility Operations	2	05/12/92
FO.13	Containerization, Preserving, Handling and Shipping of Soil and Water Samples	2	05/12/92
FO.14	Field Data Management	2	05/12/92
FO.15	Photoionization Detectors (PIDs) and Flame Ionization Detectors (FIDs)	2	05/12/92
FO.16	Field Radiological Measurements	2	05/12/92
DCN 92.04	Clarification of Seismic Lines	1	04/13/92
FO.17	Determining Out-Of-Specification Analytical Results for Environmental Samples		To Be Added
FO.18	Environmental Sample Radioactivity Content Screening	2	05/12/92
FO.19	Base Laboratory Work	1	08/30/91

This is a

# CONTROLLED DOCUMENT

EG&G - ROCKY FLATS PLANT  
ENVIRONMENTAL MANAGEMENT

This is a ~~RED Stamp~~ CONTAINERIZATION, PRESERVING, HANDLING AND SHIPPING OF SOIL AND WATER SAMPLES

EG&G ROCKY FLATS PLANT  
EMD MANUAL OPERATION SOP

Manual:  
Procedure No.:

5-21000-OPS  
FO.13, Rev. 2

Page:  
Effective Date:

1 of 18

March 1, 1992

Category 2

Organization:

Environmental Management

TITLE:  
CONTAINERIZATION, PRESERVING,  
HANDLING AND SHIPPING OF  
SOIL AND WATER SAMPLES

Approved By:



  
(Name of Approver)

MAY 12 1992  
(Date)

## 1.0 TABLE OF CONTENTS

1.0	TABLE OF CONTENTS	1
2.0	PURPOSE AND SCOPE	3
3.0	RESPONSIBILITIES AND QUALIFICATIONS	3
4.0	REFERENCES	3
4.1	SOURCE REFERENCES	3
4.2	INTERNAL REFERENCES	4
5.0	EQUIPMENT	5
5.1	EQUIPMENT LIST	5
5.2	DEPARTMENT/OFFICE CONTACT LIST	6
6.0	PROCEDURES	6
6.1	SAMPLE CONTAINERS AND PRESERVATIVE	7
6.2	CONTAINER LABELING, DECONTAMINATION, AND FIELD PACKAGING	7
6.3	CHAIN OF CUSTODY RECORD	8
6.3.1	Tampering of Sample Containers	9
6.3.2	Chain of Custody Form	10
6.4	FIELD DATA DOCUMENTATION	12
6.5	PACKAGING AND SHIPPING	13
7.0	QUALITY ASSURANCE/QUALITY CONTROL SAMPLES	17

REVIEWED FOR CLASSIFICATION/UCNI

By   
Date 

## CONTAINERIZATION, PRESERVING, HANDLING AND SHIPPING OF SOIL AND WATER SAMPLES

EG&G ROCKY FLATS PLANT	Manual:	5-21000-OPS
EMD MANUAL OPERATION SOP	Procedure No.:	FO.13, Rev. 2
	Page:	2 of 18
	Effective Date:	March 1, 1992
Category 2	Organization:	Environmental Management

8.0	DOCUMENTATION .....	18
-----	---------------------	----

### LIST OF FIGURES

FIGURE FO.13-1	SAMPLE COMPLETED COC FORM .....	11
----------------	---------------------------------	----

### LIST OF APPENDIXES

APPENDIX FO.13A	NON-RADIOLOGICAL AND RADIOLOGIC TABLES
-----------------	--

### LIST OF TABLES IN APPENDIX FO.13A

TABLE A-1	SAMPLE CONTAINERS, SAMPLE PRESERVATION, AND SAMPLE HOLDING FOR TARGET COMPOUND AND TARGET ANALYTE LIST
TABLE A-2	SAMPLE CONTAINERS, SAMPLE PRESERVATION, AND SAMPLE HOLDING TIMES FOR TARGET COMPOUNDS AND TARGET ANALYTE TESTS
TABLE A-3	SAMPLE CONTAINERS, SAMPLE PRESERVATION, AND SAMPLE HOLDING TIMES FOR RADIOLOGICAL SAMPLES - WATER MATRIX
TABLE A-4	SAMPLE CONTAINERS, SAMPLE PRESERVATIONS, AND SAMPLE HOLDING TIMES FOR RADIOLOGICAL SAMPLES - SOIL MATRIX

## CONTAINERIZATION, PRESERVING, HANDLING AND SHIPPING OF SOIL AND WATER SAMPLES

---

EG&G ROCKY FLATS PLANT	Manual:	5-21000-OPS
EMD MANUAL OPERATION SOP	Procedure No.:	FO.13, Rev. 2
	Page:	3 of 18
	Effective Date:	March 1, 1992
Category 2	Organization:	Environmental Management

---

### 2.0 PURPOSE AND SCOPE

This standard operating procedure (SOP) describes procedures that will be used at Rocky Flats to define the SOPs addressing sample containers, preservatives, handling, packaging and shipping of soil/sediment and water samples collected at the Rocky Flats Plant (RFP).

### 3.0 RESPONSIBILITIES AND QUALIFICATIONS

All personnel performing these procedures are required to have the appropriate health and safety training as specified in the site-specific Health and Safety Plan. In addition, all personnel are required to have a complete understanding of the procedures described within this SOP and receive specific training regarding these procedures.

Only qualified personnel will be allowed to perform these procedures. Required qualifications are based on minimum of a two year science related degree and/or education, previous experience, on-the-job training, and supervision by an onsite chemist. The subcontractor's project manager will document personnel qualifications related to this procedure in the subcontractor's project QA files.

### 4.0 REFERENCES

#### 4.1 SOURCE REFERENCES

A Compendium of Superfund Field Operations Methods. EPA/540/P-87/001. December 1987.

DOE 1987: The Environmental Survey Manual. DOE/EH-0053, Volumes 1-4. August 1987.

Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA. Interim Final. October 1988.

## CONTAINERIZATION, PRESERVING, HANDLING AND SHIPPING OF SOIL AND WATER SAMPLES

EG&G ROCKY FLATS PLANT	Manual:	5-21000-OPS
EMD MANUAL OPERATION SOP	Procedure No.:	FO.13, Rev. 2
	Page:	4 of 18
	Effective Date:	March 1, 1992
Category 2	Organization:	Environmental Management

RCRA Facility Investigation Guidance. Interim Final. May 1989.

Rocky Flats Plant Environmental Restoration Program, Quality Control Plan. January 1989.

Technical Enforcement Guidance Documentation (TEGD) USEPA. 1986

Test Methods for Evaluating Solid Waste, Volume II: Field Manual Physical/Chemical Methods.  
USEPA. SW-846. 3rd Edition. November 1986.

User's Guide to the Contract Laboratory Program. USEPA. December 1988.

### 4.2 INTERNAL REFERENCES

Related SOPs cross-referenced by this SOP are:

- SOP FO.3, General Equipment Decontamination
- SOP FO.14, Data Base Management
- SOP GW.6, Groundwater Sampling
- SOP GT.8, Surface Soil Sampling
- SOP SW.6, Sediment Sampling
- SOP SW.3, Surface Water Sampling
- SOP SW.7, Collection of Tap Water Samples
- SOP SW.8, Pond Sampling
- SOP SW.9, Industrial Effluent and Pond Discharge Sampling

## CONTAINERIZATION, PRESERVING, HANDLING AND SHIPPING OF SOIL AND WATER SAMPLES

---

EG&G ROCKY FLATS PLANT	Manual:	5-21000-OPS
EMD MANUAL OPERATION SOP	Procedure No.:	FO.13, Rev. 2
	Page:	5 of 18
	Effective Date:	March 1, 1992
Category 2	Organization:	Environmental Management

---

### 5.0 EQUIPMENT

#### 5.1 EQUIPMENT LIST

The following list of equipment is not intended to be task specific. The equipment and materials shown are the minimum that may be needed to ensure that proper procedures are followed for sample handling, packaging, and shipping.

- Sample containers/bottles
- Coolers
- Thermometer
- Blue ice
- Sample labels
- COC forms
- Decontamination equipment<sup>1</sup>
- Preservatives
- Baggies for containers
- Bubble wrap
- Vermiculite or equivalent
- Strapping and clear tape
- Custody seals
- Garbage bags
- Metal paint cans<sup>2</sup>

---

<sup>1</sup> Decontamination equipment and procedures are thoroughly discussed in the SOP FO.3, General Equipment Decontamination

<sup>2</sup> Large enough to accommodate sample containers

## CONTAINERIZATION, PRESERVING, HANDLING AND SHIPPING OF SOIL AND WATER SAMPLES

---

EG&G ROCKY FLATS PLANT	Manual:	5-21000-OPS
EMD MANUAL OPERATION SOP	Procedure No.:	FO.13, Rev. 2
	Page:	6 of 18
	Effective Date:	March 1, 1992
Category 2	Organization:	Environmental Management

---

Appropriate uses for the equipment listed are detailed in the following sections of this SOP.

### 5.2 DEPARTMENT/OFFICE CONTACT LIST

EG&G or its designee is responsible for providing the appropriate documentation for RAD screening, and monitoring of all field samples for shipment off site.

The on-site General Laboratories will need to be contacted before sample shipment for radiological screening and categorization of field samples.

### 6.0 PROCEDURES

Procedures for the containerizing, preserving, handling and shipping of soil and water samples detailed in this SOP follow strict criteria of the USEPA's Contract Laboratory Program. This SOP is intended to present general guidelines for proper sample handling and any deviations or modifications will be documented in the Scope of Work or specific Task Order as well as SOP addendum forms.

#### 6.1 SAMPLE CONTAINERS AND PRESERVATIVE

Only sample containers certified as clean by the manufacturer will be used for sample collection. The containers and preservatives may be obtained from the contracted analytical laboratory, their designated supplier, or a suitable chemical supply company. Any preservative(s) required may be added to the container by the contracted analytical laboratory, field sampling team, sample manager, and/or on-site chemist prior to or during sample collection.



## CONTAINERIZATION, PRESERVING, HANDLING AND SHIPPING OF SOIL AND WATER SAMPLES

---

EG&G ROCKY FLATS PLANT	Manual:	5-21000-OPS
EMD MANUAL OPERATION SOP	Procedure No.:	FO.13, Rev. 2
	Page:	7 of 18
	Effective Date:	March 1, 1992
Category 2	Organization:	Environmental Management

---

The matrices discussed in this SOP for chemical and radiological parameters are:

Soil Matrix - to include soils, sediments, and sludges (see SOP GT.8, Surface Soil Sampling, SOP SW.6, Sediment Sampling)

Water Matrix - to include surface water, groundwater and process liquids (see SOP GW.6, Groundwater Sampling; SOP SW.3, Surface Water Sampling, SOP SW.7, Collection of Tap Water Samples; SOP SW.8, Pond Sampling; and SOP SW.9, Industrial Effluent and Pond Discharge Sampling)

Tables A-1 and A-2 show both CLP and non-CLP parameters of interest for water and soil matrices with the associated container size, preservatives (chemical and/or temperature); and holding times. Tables A-3 and A-4 show radiological parameters, containers, preservatives, and holding times for water and soil matrices.

### 6.2 CONTAINER LABELING, DECONTAMINATION, AND FIELD PACKAGING

The sample bottles will be labeled by the sample manager or field sampling team. Collection time and date will be completed in the field by the sampler. The labels will indicate:

- Activity name and/or number
- Unique sample number
- Sample time and date
- Chemical preservative used
- Sample type (grab, composite)
- Analyses required
- Filtered/unfiltered

## CONTAINERIZATION, PRESERVING, HANDLING AND SHIPPING OF SOIL AND WATER SAMPLES

EG&G ROCKY FLATS PLANT  
EMD MANUAL OPERATION SOP

Manual:  
Procedure No.:  
Page:  
Effective Date:  
Organization:

5-21000-OPS  
FO.13, Rev. 2  
9 of 18  
March 1, 1992  
Environmental Management

Category 2

A sample is considered to be in a person's custody if any of the following conditions are met:

- The sample is in the person's physical possession.
- The sample is in line of sight of the person after he/she has taken possession.
- The sample is secured by that person so that any tampering can be detected.
- A sample is secured by the person in possession in an area which only authorized personnel can enter.

### 6.3.1 Tampering of Sample Containers

If, at any time after samples have been secured, custody seals are identified as having been tampered with, this procedure will be followed to ensure that sample integrity has not been compromised.

- Check cooler temperature to verify 4°C.
- Check with all personnel having access to sample coolers to verify possible inadvertent tampering.
- Check every sample container for any signs of tampering, such as loose lids, foreign objects in containers, broken or leaking containers, etc.
- Check to ensure adequate and appropriate packaging.
- Document all findings of the incident in the sample manager's field log book.

## CONTAINERIZATION, PRESERVING, HANDLING AND SHIPPING OF SOIL AND WATER SAMPLES

---

EG&G ROCKY FLATS PLANT	Manual:	5-21000-OPS
EMD MANUAL OPERATION SOP	Procedure No.:	FO.13, Rev. 2
	Page:	10 of 18
	Effective Date:	March 1, 1992
Category 2	Organization:	Environmental Management

---

If it is determined that malicious tampering of samples has occurred and/or it is believed that sample integrity has been compromise the subcontractor will immediately contact EG&G.

If it can be determined that sample integrity has not been compromised based on the above criteria, document findings in sample manager's field logbook and proceed with this standard operating procedure.

### 6.3.2 Chain of Custody Form

The four-page carbonless COC Form (Form FO.13A) is shown in Section 8.0, Documentation. An example of a completed COC Form is illustrated in Figure FO.13-1. The original and second (yellow) copy will be included with the samples to be shipped enclosed in a plastic bag and taped inside the lid of the cooler. The third (pink) copy along with a photocopy of the original will remain on file at the subcontractors on-site facility. The fourth (goldenrod) copy is for EG&G project managers requesting copies. The contract laboratory will sign as having received the samples and return the yellow copy of the COC to the project management office for verification by the QA/OC officer or their designee. The yellow and pink copies will then be matched and filed to complete the chain of custody procedure.

The chain of custody form will include the following information:

- Unique sample number and sample location
- Project number
- Date and time of sample collection
- Signature of collector or field custodian
- Laboratory designation
- Sample matrix
- Condition of sample on receipt at the laboratory

PROJECT # 4000-0

LAB/LOCATION FY Labs / Flint, Mich

1000

## REG&G ROCKY FLATS, CHAIN OF CUSTODY

## SHIPMENT METHOD

## CONTAINERIZATION, PRESERVING, HANDLING AND SHIPPING OF SOIL AND WATER SAMPLES

EG&G ROCKY FLATS PLANT	Manual:	5-21000-OPS
EMD MANUAL OPERATION SOP	Procedure No.:	FO.13, Rev. 2
	Page:	12 of 18
	Effective Date:	March 1, 1992
Category 2	Organization:	Environmental Management

- Chain of custody control number
- Signature and date blocks for personnel relinquishing or receiving sample custody
- Space for additional comments
- Name and phone number of emergency contact person
- Analysis requested
- Out of spec reporting

### 6.4 FIELD DATA DOCUMENTATION

All field descriptions, measurements, and observations will be recorded on the appropriate field data forms (see specific sampling SOPs and SOP FO.14, Field Data Management) in accordance with SOP FO.2, Field Data Documentation. The original data forms will be collected and filed on site by the designated subcontractor's data entry personnel. These forms are to be bound and submitted to EG&G with an accompanied transmittal letter at the completion of the task. This form is an example of data entries required for the Rocky Flats Environmental Data System (RFEDS) database. Data may also be recorded in field logbooks if desired. Field data will be filled out at the time a sample is taken and will include, but not be limited to, the following information:

- Sampling activity name and number
- Sampling point name and number
- Sample number\*
- Name(s) of collector(s) and others present
- Date and time of sample collection\*
- Sample container tag/label number (if appropriate)\*
- Preservative(s) used\*
- Requested analyses\*

---

Items will be documented on the COC Form.

## CONTAINERIZATION, PRESERVING, HANDLING AND SHIPPING OF SOIL AND WATER SAMPLES

---

EG&G ROCKY FLATS PLANT	Manual:	5-21000-OPS
EMD MANUAL OPERATION SOP	Procedure No.:	FO.13, Rev. 2
	Page:	13 of 18
	Effective Date:	March 1, 1992
Category 2	Organization:	Environmental Management

---

- Sample matrix
- Filtered/unfiltered
- Designation of QC samples (ONLY for MS and MSD)
- Collection methods
- Chain of custody control numbers
- Field observations and measurements during sampling (comment section)
- Signature of responsible observer

### 6.5 PACKAGING AND SHIPPING

Prior to commencement of field activities, estimated levels of chemical and/or radiological contaminants will be determined from known historical data for all matrices to be sampled by EG&G or its designee. This SOP addresses procedures for low, medium, and high level concentrations. The three levels of concentrations are defined as follows:

- Low-Concentration Samples - The contaminant of highest concentration is present at less than 10 parts per million (ppm). Examples include background environmental samples.
- Medium-Concentration Samples - The contaminant of highest concentration is present at a level greater than 10 ppm and less than 150,000 ppm (0.001 - 15 percent). Examples include material that is obviously weathered.
- High-Concentration Samples - At least one contaminant is present at a level greater than 150,000 ppm (15 percent). Samples from drums and tanks are assumed to high concentration unless information indicates otherwise.

## CONTAINERIZATION, PRESERVING, HANDLING AND SHIPPING OF SOIL AND WATER SAMPLES

---

EG&G ROCKY FLATS PLANT	Manual:	5-21000-OPS
EMD MANUAL OPERATION SOP	Procedure No.:	FO.13, Rev. 2
	Page:	14 of 18
	Effective Date:	March 1, 1992
Category 2	Organization:	Environmental Management

---

Radiation screening of field samples as determined by EG&G and their subcontractors will be sent to the on-site General Laboratory. When the on-site General Laboratory cannot process the sample, a 40 ml aliquot of sample is sent to an EG&G designated offsite laboratory. The remainder of the sample is kept at the subcontractor's field facilities until results are reported back to the subcontractor. The Rad screening procedures determine which laboratory receives samples based on results of greater than (GT) OR less than (LT) 50 picocuries/liter for waters or 50 picocuries/gram for soils. The Rad screening procedures will also enable the subcontractor to follow applicable Department of Transportation (DOT) guidelines for shipment of these environmental samples.

All sample containers will have been decontaminated and bagged in the field. Upon receipt and verification of sample containers and COC forms, the following steps will be taken:

- The designated laboratory will be notified prior to shipment if samples collected in the field are suspected of containing any other substance for which the laboratory personnel should take additional safety precautions.
- Subcontractors are responsible for radiologically clearing all containers prior to shipment off site in accordance with Environmental Monitoring Radiological Guidelines (EMRD) HSP 18.10, Health and Safety Practices Manual (HSP).
- Obtain property passes signed by the Construction Management Coordinator and the Radiation Site Survey Officer and/or subcontractors radiation monitor so that coolers may be shipped off site.
- Line the sample cooler with a large plastic bag.
- Place approximately 3 inches of vermiculite in the bottom of the cooler.

## CONTAINERIZATION, PRESERVING, HANDLING AND SHIPPING OF SOIL AND WATER SAMPLES

EG&G ROCKY FLATS PLANT  
EMD MANUAL OPERATION SOP

Manual:  
Procedure No.:  
Page:  
Effective Date:  
Organization:

5-21000-OPS  
FO.13, Rev. 2  
15 of 18  
March 1, 1992  
Environmental Management

Category 2

- Wrap glass containers in bubble pack.
- Verify that all samples requiring screening have reported estimated radiological activity levels.
- Place bagged and wrapped sample containers (except VOC vials) upright in the cooler with approximately 1 inch between them.
- Place bagged and wrapped sample containers upright, except for the volatile organic compounds (VOC) vials in the cooler with approximately 1 inch between them and the sides of the cooler.
- Fill the cooler approximately three-quarters full of vermiculite, making sure that sample containers are securely packed.
- Insert the two VOC vials upright in the center of the cooler.
- Fill the cooler with vermiculite, allowing adequate space at the top for blue ice.
- Bag the blue ice (or equivalent) and place several packages in the top space of the cooler".
- Seal the signed COCs in a plastic bag and tape it to the underside of the lid of the cooler.
- Tape the drain of the cooler shut.

" See Appendix A, Tables 1 and 2 for parameters requiring  $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$ .



## CONTAINERIZATION, PRESERVING, HANDLING AND SHIPPING OF SOIL AND WATER SAMPLES

EG&G ROCKY FLATS PLANT  
EMD MANUAL OPERATION SOP

Manual:  
Procedure No.:  
Page:  
Effective Date:  
Organization:

5-21000-OPS  
FO.13, Rev. 2  
16 of 18  
March 1, 1992  
Environmental Management

Category 2

- Wrap strapping tape around the cooler in two locations to secure the lid.
- Place the airbill on top of the cooler. If more than one cooler is sent to the same laboratory, an address label and a manifest label are needed.
- Place "This Side Up" and "Fragile" labels on the top and two sides of the cooler.
- Place "↑" labels on all four sides of the cooler.
- Place "Environmental Samples" labels on top of cooler. For coolers weighing over 75 pounds, an additional "Heavy Weight" label is required in the two opposite corners on top of the cooler.
- Place signed and dated custody seals in two locations sealing the cooler lid so that tampering will be evident.

The following steps will be taken for samples suspected of containing both medium and/or high level concentrations:

- Enclose all sample containers in clear plastic bags.
- Pack all medium and high level water and soil samples in metal paint can.
- Label paint cans with sample number of sample contained inside.
- Surround contents of can with non-combustible, absorbent packing material.
- Use freezer packages cool samples to 4°C.

## CONTAINERIZATION, PRESERVING, HANDLING AND SHIPPING OF SOIL AND WATER SAMPLES

---

EG&G ROCKY FLATS PLANT	Manual:	5-21000-OPS
EMD MANUAL OPERATION SOP	Procedure No.:	FO.13, Rev. 2
	Page:	17 of 18
	Effective Date:	March 1, 1992
Category 2	Organization:	Environmental Management

---

- Pack sealed paint cans or plastic-enclosed sample bottles in shipment container.
- Use a plastic or metal ice chest for shipment (do not use cardboard or styrofoam containers to ship samples).
- Surround contents with non-combustible, absorbent packing material (do not use earth or ice packing materials).
- Tape paperwork in plastic bags under cooler lid.
- Close cooler and seal with custody seals.

Sample coolers may be received by courier at a predetermined area at RFP. If arrangements cannot be made, a company vehicle is required to deliver sample coolers to the laboratory and/or courier office.

### 7.0 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

Quality Assurance (QA) and Quality Control (QC) will be administered according to the Quality Assurance Project Plan (QAPjP), the project-specific Quality Assurance Addendum (QAA), and QC requirements presented in this SOP.

### 8.0 DOCUMENTATION

Documentation of observations and data acquired in the field will provide information on the handling and preparation of the samples collected in addition to a permanent record. Sampling personnel will be responsible for documenting the handling preparation, packaging, and shipping of the samples. These observations and data will be recorded with black waterproof ink on subject

## CONTAINERIZATION, PRESERVING, HANDLING AND SHIPPING OF SOIL AND WATER SAMPLES

EG&G ROCKY FLATS PLANT  
EMD MANUAL OPERATION SOP

Manual:  
Procedure No.:  
Page:  
Effective Date:  
Organization:

5-21000-OPS  
FO.13, Rev. 2  
18 of 18  
March 1, 1992  
Environmental Management

Category 2

specific data sheets, (i.e. instrument calibration data sheet, field measurement data sheet and/or field logbooks).

Copies of the chain of custody records for the samples shipped during the data collection task will be kept on file at the site office and the subcontractor's main office.

## SAMPLERS.

SITE CONTACT/PHONE

PROJECT #

LAB/LOCATION:

C-O-C NUMBER

EG&G ROCKY FLATS, CHAIN OF CUSTODY

[illegible]

**BOTTLE  
CODES  
PRESERVATIVE**

NUMBER OF CONTAINERS

MEDIA SOIL(S) WATER (W)

FILTERED-F POT DISS=P

TURN AROUND RUSH - R

OUT OF SPEC REPORTS

134

CONF

R	A	B	C	D	F		GROSS ALPHA / BETA
R	A	B	C	D	F		PU 239/240 AM241
R	A	B	C	D	F		U 233/234,235,238
R	A	B	C	D	F		SR89/90 CS137 (1)
R	A	B	C	D	F		TH230/232,CM244,NP237
R	A	B	C	D	F	*	DISS GROSS ALPHA/BETA
R	A	B	C	D	F	*	DISS PU 239/240 AM 241
R	A	B	C	D	F	*	DISS U233/234,235,238
R	A	B	C	D	F	*	DISS SR 89/90 CS 137 (1)
R	A	B	C	D	F	*	DISS TH230/2 CM244 NP237
R	A	B	C	D	F		TRITIUM (H3)
R	A	B	C	D	F		RAD SCREEN

## LABORATORY USE ONLY

DATE/TIME

DATE/TIME	RECEIVED BY

RELINQUISHED BY

 $\mathbf{Z}$   
 $\mathbf{Y}$ 

PCKG REC'D/CUSTODY SEALS INTACT

**SAMPLE LABELS/COCs AGREE**

TEMPERATURE WITHIN SPECIFICATION \_\_\_\_\_C

**CORRECTED COPY ATTACHED**

PROBLEMS OR DISCREPANCIES

REMARKS	* INDICATES FILTERED SAMPLE (1) • CS 134 WHEN BY GAMMA
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	
42	
43	
44	
45	
46	
47	
48	
49	
50	
51	
52	
53	
54	
55	
56	
57	
58	
59	
60	
61	
62	
63	
64	
65	
66	
67	
68	
69	
70	
71	
72	
73	
74	
75	
76	
77	
78	
79	
80	
81	
82	
83	
84	
85	
86	
87	
88	
89	
90	
91	
92	
93	
94	
95	
96	
97	
98	
99	
100	

SHIPMENT METHOD

LAB/LOCATION:

EG&G ROCKY FLATS, CHAIN OF CUSTODY

REMARKS	(1) INCLUDES Cs, Li, Sr, Mo, Si, Sn	(2) TSS, TDS, Cl, F, SO4, CO3, HCO3

\_\_\_\_\_

1001

1

1

4,CO<sub>3</sub>,HCO<sub>3</sub>

SS, TDS, Cl, F, SO

SHIPMENT METHOD

15

## SAMPLERS.

## PROJECT

SITE CONTACT/PHONE

LAB/LOCATION:

C-O-C NUMBER

## EG&G ROCKY FLATS, CHAIN OF CUSTODY

[illegible]

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME	LABORATORY USE ONLY	Y	N
				PCKG REC'D/CUSTODY SEALS INTACT		
				SAMPLE LABELS/COCs AGREE		
				TEMPERATURE WITHIN SPECIFICATION _____C		
				CORRECTED COPY ATTACHED		
REMARKS				PROBLEMS OR DISCREPANCIES		

## SHIPMENT METHOD

**APPENDIX FO.13A**  
**NON-RADIOLOGICAL AND RADIOLOGICAL TABLES**

TABLE A-1  
SAMPLE CONTAINERS, SAMPLE PRESERVATION, AND SAMPLE HOLDING TIMES FOR  
TARGET COMPOUND AND TARGET ANALYTE LISTS

WATER MATRIX

Parameter	Container	Preservative	Holding Time
<u>Liquid - Low to Medium Concentration Samples</u>			
<b>Organic Compounds:</b>			
Purgeable Organics (VOCs)	2 x 40-mL VOA vials with teflon lined septum lids	Cool, 4°C <sup>a</sup>	7 days
Extractable Organics (BNAs), Pesticides and PCBs	1 x 4-L amber <sup>b</sup> glass bottle	Cool, 4°C <sup>a</sup>	7 days until extraction, 40 days after extraction
Organophosphorus Pesticides and Herbicides	1 x 4-L amber <sup>b</sup> glass bottle	Cool, 4°C	7 days until extraction, 40 days after extraction
Dioxins/Furans	2 x 1-L amber <sup>b</sup> glass bottles	Cool, 4°C	7 days until extraction, 40 days after extraction
<b>Inorganic Compounds:</b>			
Metals (TAL)	1 x 1-L polyethylene bottle	Nitric acid pH < 2	6 mo <sup>c</sup>
Cyanide	1 x 1-L polyethylene bottle	Sodium hydroxide <sup>d</sup> pH > 12; Cool, 4°C	14 days
Sulfide	1 x 500 ml polyethylene bottle	mL-zinc acetate and sodium hydroxide to pH > 9; Cool, 4°C	7 days

<sup>a</sup>Add 0.008% sodium thiosulfate (Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>) in the presence of residual chlorine

<sup>b</sup>Container requirement is for any or all of the parameters given.

<sup>c</sup> Holding time for mercury is 28 days.

<sup>d</sup> Use ascorbic acid only if the sample contains residual chlorine greater than 0.2 mg/l. Test a drop of sample with potassium iodine-starch test paper; a blue color indicates need for treatment. Add ascorbic acid, a few crystals at a time, until a drop of sample produces no color on the indicator paper. Then add an additional 0.6g of ascorbic acid for each L of sample volume.



TABLE A-1 (continued)  
SAMPLE CONTAINERS, SAMPLE PRESERVATION, AND SAMPLE HOLDING TIMES  
FOR MISCELLANEOUS PARAMETERS

WATER MATRIX

Parameter	Sample Volume/ Container <sup>a</sup>	Preservative	Holding Time
<u>Liquid - Low to Medium Concentration Samples</u>			
Acidity	200 mL/P, G	Cool, 4°C	14 days
Alkalinity	200 mL/P, G	Cool, 4°C	14 days
Bacteriological	1 L/P,G	Cool, 4°C	6 hr
Static Bioassay	4 L	Cool, 4°C	48 hr
Biochemical Oxygen Demand (BOD)	2 L/P, G	Cool, 4°C	48 hr
Chemical Oxygen Demand (COD)	300 mL, P, G	Cool, 4°C, Sulfuric Acid to pH < 2	28 days
Chloride	200 mL/P, G	None	28 days
Chlorine Residual	In situ, beaker or bucket	None	Analyze immediately
Color	200 mL	Cool, 4°C	48 hr
Conductivity	300 mL/P, G	Cool, 4°C	28 days (determine on-site if possible)
Chromium, Hexavalent	200mL/P, G	Cool, 4°C	24 hr
Dissolved Oxygen (DO) (Probe)	In situ, beaker or bucket	None	Determine on-site
Dissolved Oxygen (DO) (Winkler)	300 mL glass, BOD bottle	Fix on site, store in dark	8 hr (deter- mine on-site if possible)

<sup>a</sup> P = Plastic (polyethylene)  
G = Glass  
BOD = Biological Oxygen Demand

TABLE A-1 (continued)

SAMPLE CONTAINERS, SAMPLE PRESERVATION, AND SAMPLE HOLDING TIMES  
FOR MISCELLANEOUS PARAMETERS

## WATER MATRIX

Parameter	Sample Volume* /Container	Preservative	Holding Time
<u>Liquid - Low to Medium Concentration Samples (continued)</u>			
Toxicity Characteristic Leaching Procedure (TCLP)	4 L amber glass	Cool, 4°C	Extract within 7 days, analyze within 40 days
Fluoride	1 L/P	None	28 days
Hardness	300 mL/P, G	1:1 Nitric Acid, pH < 2	6 mo
Nutrients <sup>b</sup>	2 L/P, G	1:1 Sulfuric Acid, pH < 2, Cool, 4°C	28 days
Oil and Grease	1-L widemouth amber glass with Teflon liner	1:1 Sulfuric Acid, pH < 2, Cool, 4°C	28 days
Organic Halides - Total (TOX)	250 mL amber glass with Teflon lined septum closure	Sulfuric Acid, pH < 2; Cool, 4°C	14 days
pH	In situ, beaker or bucket	None	Analyze Immediately
Phenols	1-L amber glass with Teflon lined closure	1:1 Sulfuric Acid, pH < 2, Cool, 4°C	28 days
Phosphate-Ortho	1-L/P, G	Cool, 4°C	48 hr
Phosphorus, Total Dissolved	500 mL/P, G	1:1 Sulfuric Acid, pH < 2, Cool, 4°C	28 days

\* P = Plastic (polyethylene); G = Glass

<sup>b</sup> May include nitrogen series (ammonia, total Kjeldahl, nitrogen, nitrate-nitrite), total phosphorus, chemical oxygen demand.

TABLE A-1 (continued)

SAMPLE CONTAINERS, SAMPLE PRESERVATION, AND SAMPLE HOLDING TIMES  
FOR MISCELLANEOUS PARAMETERS

## WATER MATRIX

Parameter	Sample Volume/ <sup>a</sup> Container	Preservative	Holding Time
<u>Liquid - Low to Medium Concentration Samples (continued)</u>			
Solids, Settleable	2 L/P, G	Cool, 4°C	48 hr
Solids (Total and Suspended, etc.)	1 L/P, G	Cool, 4°C	7 days
Sulfates	500 mL/P, G	Cool, 4°C	28 days
Sulfides	500 mL/P, G	2 mL Zinc Acetate and Sodium Hydroxide to pH > 9 Cool, 4°C	7 days
Temperature	In situ, beaker or bucket	None	Analyze Immediately
Turbidity	200 mL/P, G	Cool, 4°C	48 hr

Note: When nonspecific container type is listed (e.g., 8-oz. wide-mouth glass jar), select a container appropriate to the volume and container requirement given. Samples for more than one parameter can be collected into a single container if container and preservation requirements are the same (e.g., sulfate and turbidity).

<sup>a</sup> ASAP = as soon as possible  
NS = not specified  
P = Plastic  
G = Glass

**TABLE A-2**  
**SAMPLE CONTAINERS, SAMPLE PRESERVATION, AND SAMPLE HOLDING TIMES**  
**FOR TARGET COMPOUND AND TARGET ANALYTE LISTS**

**SOIL MATRIX**

Parameter	Container	Preservative	Holding Time
<u>Soil, Sediment or Sludge Samples - Low to Medium Concentrations</u>			
<b>Organic Compounds:</b>			
Purgeable Organics (VOCs)	120-mL capped core	Cool, 4°C	7 days
Extractable Organics (BNAs), Pesticides and PCBs	1 x 8-oz wide-mouth glass jar	Cool, 4°C	7 days until extraction, 40 days after extraction
Organophosphorus Pesticides and herbicides	1 x 8-oz wide-mouth <sup>b</sup> glass jar	Cool, 4°C	7 days until extraction, 40 days after extraction
Dioxins/Furans	1 x 8-oz wide-mouth glass jar	Cool, 4°C	7 days until extraction, 40 days after extraction
<b>Inorganic Compounds:</b>			
Metals (TAL)	1 x 8-oz wide-mouth glass jar	None	6 mo <sup>b</sup>
Cyanide	1 x 8-oz wide-mouth glass jar	None	14 days
Sulfide	1 x 8-oz wide-mouth glass jar	None	7 days

<sup>b</sup>Holding time for mercury is 28 days.

TABLE A-2 (continued)  
SAMPLE CONTAINERS, SAMPLE PRESERVATION, AND SAMPLE HOLDING TIMES FOR  
MISCELLANEOUS PARAMETERS

SOIL MATRIX

Parameter	Sample Volume /Container	Preservative	Holding Time
<u>Soil, Sediment or Sludge Samples - Low to Medium Concentrations</u>			
Toxicity Characteristic Leaching Procedure (TCLP)	8-oz wide-mouth glass with Teflon®-lined lid closure	None	Extract 7 days, Analyze within 40 days
Nutrients, including: Nitrogen, Phosphorus, Chemical Oxygen Demand	8-oz wide-mouth glass with Teflon®-lined closure	None	ASAP <sup>a</sup>
Other Inorganic Compounds	8-oz wide-mouth glass with Teflon®-lined closure	None	ASAP <sup>a</sup>

Note: When no specific container type is listed (e.g., 8-oz. wide mouth glass jar), select a container appropriate to the volume and container requirements given. Samples for more than one parameter can be collected into a single container if container and preservation requirements are the same.

<sup>a</sup>ASAP = as soon as possible

**TABLE A-3**  
**SAMPLE CONTAINERS, SAMPLE PRESERVATION, AND SAMPLE HOLDING TIMES**  
**FOR RADIOLOGICAL SAMPLES**

**WATER MATRIX**

Parameter	Container	Preservative	Holding Time
Radiological tests <sup>a</sup>	3 x 4L plastic containers <sup>b</sup>	HNO <sub>3</sub>	6 mo
Tritium	125 mL glass	None	None

<sup>a</sup> For Radiological Testing, the specific analyses will be defined as some or all of the following: Gross Alpha, Gross Beta, Uranium 233 + 234, 235 and 238, Americium 241, Plutonium 239 + 240, Tritium, Strontium 90, 89, Cesium 137, Radium 226, 228.

<sup>b</sup> Full suite

TABLE A-4  
SAMPLE CONTAINERS, SAMPLE PRESERVATION, AND SAMPLE HOLDING  
TIMES FOR RADIOLOGICAL SAMPLES

SOIL MATRIX

Parameter	Container	Preservative	Holding Time
Radiological tests <sup>a</sup> and Tritium	500 mL wide mouth glass <sup>b</sup>	None	None

<sup>a</sup> For Radiological Testing, the specific analyses will be defined as some or all of the following: Gross Alpha, Gross Beta, Uranium 233 + 234, 235 and 238, Americium 241, Plutonium 239 + 240, Tritium, Strontium 90, 89, Cesium 137, Radium 226, 228.

<sup>b</sup> Full suite